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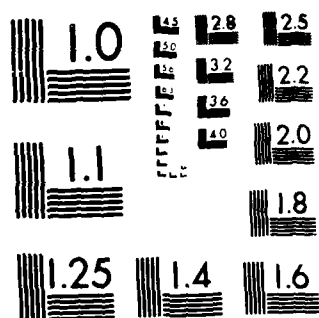
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Stress/Fatigue and the ARNG Aviator		5. TYPE OF REPORT & PERIOD COVERED  Study Project
7. AUTHOR(s)  Col Kenneth D. Rhoades		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS  US Army War College Carlisle Barracks, PA 17013		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS  Same		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
13. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE  March 1988
		13. NUMBER OF PAGES  37
		14. SECURITY CLASS. (of this report)  Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution is unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  over		

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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As a result of national policy, Army National Guard (ARNG) aviation units contain thirty-three percent of today's United States Army aviation program. In the event of a national emergency requiring military force, Guard aviation is scheduled to be mobilized and used along with Active Component aviation; no other force structure choice exists. Increased reliance on Guard aviation has brought more equipment, additional training facilities, and dramatic increases in individual aviator training requirements. In addition, ARNG aviation national defense responsibility is increasing with the addition of new equipment and reorganized aviation force structure. By 1989, ARNG aviation will include 283 units with authorization for over 6,600 aviators and 2400 aircraft. The long-term success of ARNG aviation requires that Guard leaders and individual aviators be aware of and minimize stress and its effects. Training Guard aviators, who must safely meet the same training requirements as their Active Army counterparts, represents a significant ARNG leadership challenge. Yet stress in the ARNG aviation environment has received very little research attention. This research paper will examine stress, stressors in the ARNG aviation program, and means of minimizing the harmful effects of stress in Guard aviation programs.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

USAWC MILITARY STUDIES PROGRAM PAPER

STRESS/FATIGUE AND THE ARNG AVIATOR

AN INDIVIDUAL STUDY PROJECT

by

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U.S. Army War College  
Carlisle Barracks, Pennsylvania 17013  
28 March 1988

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## ABSTRACT

AUTHOR: Kenneth D. Rhoades, COL, AV  
TITLE: STRESS/FATIGUE and the ARNG AVIATOR  
FORMAT: Individual Study Project  
DATE: 28 March 1988 PAGES: 34  
CLASSIFICATION: Unclassified

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## CHAPTER I

### INTRODUCTION

It is 4 a.m. on a cold, winter morning with an overcast sky and forecast icing conditions. Chief Warrant Officer Frank Smith, an Active Guard Reserve (AGR) officer, is "preflighting" a U.S. Army fixed wing turbo-prop aircraft in a warm, well-lighted hanger. In a few minutes, with Frank at the controls, the aircraft, co-pilot, and six passengers will be rolling down a runway and departing Harrisburg International Airport for New York City. What the passengers do not know is that Frank is tired, not fully alert, flying into poor weather and a high density air traffic area. Frank is performing in an environment of stress: the stress of having to plan, preflight, and fly, as well as the stress of last night's racket ball tournament and reduced sleep because of the early takeoff. Frank does have a co-pilot to help him out; with luck his part-time ARNG co-pilot will be rested.

The date is July 16, 1987, and Captain Joe Green, a full-time Guard Military Technician, is working with two student pilots. They are planning a night vision goggle (NVG) flight, with a planned take-off time well after dark. Joe will not finish tonight's training until after 2 a.m. because of Daylight Savings Time and a mission of two, two hour training flights. Joe, unlike Frank, has no co-pilot, only two part-time ARNG NVG students, one for each flight period. Neither have flown with night vision devices before. Joe feels "OK", but he just found out today that his wife is going to have another baby, his son was expelled from school, and his father has cancer. His father has been ill for sometime, which has worried Joe, but the recent discovery that cancer is the problem really has him upset.

These hypothetical cases, while not completely typical of events in Army Aviation, nonetheless profile training situations of many Active Army and ARNG pilots. Stress, in short, affects us all. Stress is something most of us do not think about much, but the immediate result of excess stress is fatigue, which has a direct, negative effect on our ability to perform.<sup>1</sup> Although we have much current information on stress and fatigue, many people do not connect the two. The stress and resulting fatigue of modern life, coupled with a requirement for Army National Guard pilots to operate complex equipment, have resulted in aviation accidents involving loss of life and aircraft. Thus to provide combat ready military units ARNG leaders must confront this critical performance factor.

Maintaining combat-ready Guard aviation units is important because of Department of Defense Total Force Policy. The implementation of this policy in 1973 changed the Guard aviation program from a back-up organization to the Active Army to a full partner in the Army's national defense effort. Total Force policy dictates that national defense be provided for through increased reliance on military reserve forces. In accordance with Total Force Policy, more aviation force structure has been added and supporting resources supplied to the Guard. Increased reliance on Guard aviation has brought more aircraft, more training facilities, and dramatic increases in training requirements. As a result, stress on the part-time ARNG aviator has also dramatically increased.

The problem of stress in work organizations has received much attention during recent years. Many studies seek to establish relationships among employees' poor health, decreased work performance, decreased organizational effectiveness, increased job absenteeism, and

accidents.<sup>2</sup> Yet, despite current recognition of stress as a critical aspect of organizational effectiveness, little effort has been made to relate current knowledge to the situation faced by part-time Army National Guard (ARNG) military aviators. This research paper will examine the Army's approach to stress, stressors from the ARNG, and ways to minimize the harmful effects of stress on the Guard aviation program. It will include recommendations about how ARNG leaders may be able to improve aviation unit combat readiness through more effectively dealing with individual aviator stress.

#### ENDNOTES

1. Headquarters D.A., Field Manual (FM) 1-301, Aeromedical Training For Flight Personnel, Fort Rucker, Alabama: U.S. Army Aviation Center, May 1987, pp. 2-13

2. Alan A. Mc Lean, Work Stress, Addison-Wesley Publishing Company, Reading Massachusetts, 1979, pp.66

## CHAPTER II

### STRESS and ITS RESULT

Stress, a term often used to account for personnel problems, is really a term from the physical sciences, where it describes a force or pressure exerted on a part or parts of a physical or mechanical structure. By analogy, the term has become commonplace in discussions of the pressures individuals face within and outside the workplace. Most of the stresses we all face are part of normal living, but when stress exceeds a person's ability to withstand it, when it detracts from or interferes with job performance, it presents serious problems. When the level or time period of stress exceeds a certain limit, a limit which varies among individuals, individual performance will suffer.<sup>1</sup> Army leaders believe an elevated level of stress on Army personnel results in a loss of discipline and efficiency.<sup>2</sup> When this happens to the Army aviator and he continues to fly, accidents can be the result.

Army accidents are categorized in groups of Class A through E, with Class A being the most serious. Accident rates in the ARNG are historically lower than those of the Active Army. Still the ARNG had 4 Class A, 3 Class B, and 19 Class C aircraft accidents in the first ten months of fiscal year 1986, an overall accident rate of 1.12 per 100,000 flying hours. These accidents resulted in one fatality and 14 injuries; they cost more than \$3,440,000.<sup>3</sup>

Of the four class A aircraft accidents, three were attributed to human error. Human error accidents, according to the December 1987 Department of the Army Aviation Medicine News Letter, now account for

ninety percent of Army aircraft accidents. Human error resulting from deviation from published guidance is a continual problem for the ARNG. Guard aviators must consistently follow procedures--the problem is how to get them to do so. The Guard has put much emphasis on "by-the-book" procedures. Leaders hold individuals and their supervisors accountable for their actions when there is disregard or violation of published directives. Even so, human error accidents resulting from violation of procedures continue to happen.<sup>4</sup>

Are a significant number of human error accidents directly related to stress? This question is difficult, if not impossible, to answer. When a pilot flies into wires or crashes an overloaded aircraft, we often know that human error was the cause of the accident. However, in accidents involving fatalities the causes of a specific pilot behavior can only be guessed at. Faulty decisions can be correctly attributed to pilot error, but attributing a faulty decision to stress is another matter. Nevertheless, Army accident prevention efforts assume that many human error accidents can be directly attributed to stress. As a result Army programs include instruction on the danger of excessive stress, recommend ways to minimize the effects of stress, and place stress prevention restrictions on pilots. Current ARNG accident prevention efforts include education and flying restrictions, but human error accidents still take place.

All work involves some degree of fatigue-producing stress. So the key is to cope effectively with stress and to make it work to our advantage instead of against us. First, the aviator should recognize how stress affects him, then he must realize when he is overly stressed. So through self-analysis the individual should take as much control of his life as

possible by minimizing self-imposed stresses. The Army cites the following self-imposed stressors: smoking, alcohol over-indulgence, over-exertion, and over-commitment to a variety of activities. Some self-imposed stresses are considered helpful in increasing our ability to successfully cope with stress, such as limited physical exercise.<sup>5</sup> Helpful stress enables a person to better cope with harmful stress and thereby reduces the amount of stress produced fatigue.

Stress and fatigue can become acute or chronic. Acute stress is intense in nature and happens within a short time, resulting in acute fatigue. Chronic stress, on the other hand, is not as intense but can last for months or years. Chronic stress coupled with intense acute stress can result in severe acute fatigue, which can seriously weaken a pilot's ability to operate an aircraft safely. Part of the fatigue problem may manifest itself through physical exhaustion. However, stress as well produces mental fatigue, which presents the most serious problems for aviators, because the pilot may not recognize them.<sup>6</sup>

Guard aviators are not just pilots. Many are unit commanders, section leaders, planners, and supervisors of various activities. For the Guard aviator to succeed in the Guard aviation environment, he must be rested and mentally alert. The Guard needs aviators that are aware of their individual situations and able to act on this knowledge. In addition, aviators should be more than simply aware of personal stress and fatigue; beyond awareness, aviators must also have some ability to control their environment. Both the full-time and part-time Guard leadership should do all they can to eliminate unnecessary stress from Guard aviation.

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2. Headquarters D.A., Field Manual (FM) 22-100, Military Leadership, Fort Leavenworth, Kansas: Combined Arms Center, October 1983, pp. 139.

3. Departments of the Army and Air Force, National Guard Bureau, ARNG Aviation Program Management, Washington, D.C., September 1986, pp. 5-8.

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6. Ibid., pp. 2-11

## CHAPTER III

### ARNG AVIATION PROGRAM STRESSORS

Army National Guard (ARNG) aviation units comprise thirty-three percent of today's Total Army (Active Army, ARNG, Army Reserve) aviation program. In a military national emergency, Guard aviation is scheduled to be mobilized and used along with active component aviation; no other force structure choice exists. Increased reliance on Guard aviation has brought more equipment, more training facilities and dramatic increases in individual aviator training requirements. Moreover, ARNG aviation's national defense responsibility is increasing with the addition of new equipment and reorganized aviation force structure. By 1989, ARNG aviation will include 283 units with authorization for over 6,600 aviators and 2,400 aircraft.<sup>1</sup>

The success of the Total Army aviation program may depend on Guard leaders being able to identify and minimize program stressors. To provide part-time ARNG aviators who can meet most full-time training performance standards is difficult, but not an impossible task. To complete the Total Force Army aviation mission, Guard aviation training time must be scheduled and used in an efficient way that maximizes training opportunity, yet minimizes the stress on program participants. If stress is not minimized, the Guard's all-volunteer force may prematurely quit the program and new volunteers may be difficult to recruit. For Guard aviation to be capable of accomplishing its wartime mission, a delicate balance must be maintained between effective, realistic training and a minimum stress environment. The purpose of this chapter is to review the



Guard aviation program and suggest what may happen if stress is not reduced.

#### Training guidance

The National Guard does not develop their own programs. Rather it establishes training based on the regulations and guidance received from the Active Army. The aviation training requirements and performance standards set for Guard aviators are the same as those for the Active Army. Regulations and other training guidance published for the Army applies to the Guard as part of the Total Force. Army regulations that are not considered adequate for Guard operations are supplemented by National Guard regulations and can be further supplemented by State ARNG regulations. Most training guidance is necessary and helpful for guiding ARNG training activities.

#### Sources of stress

The main goal of the ARNG is to be prepared to provide combat-ready military units in the event of a national emergency. Today's ARNG aviation program demands that individual aviators maintain proficiency in such areas as terrain flight, instrument flight, and night vision goggle flight. This same aviator must also be proficient in his assigned aircraft specialties, such as aero scout or aerial gunnery. Once the above tasks are mastered, the Guard aviator is required to develop and maintain an understanding of his duties and ability to work as part of a unit combat team. For long-term military career development, all aviators must also meet military education requirements that consist of attendance at active army schools or the completion of correspondence courses.

Membership in the Guard is a part-time job with stressful full-time requirements.

The Guard aviator, however, may be faced with completing his military schooling requirements, his aviator requirements, and his command or leadership responsibilities all at the same time. This happens when the aviator is enrolled in various military correspondence courses. Reducing simultaneous requirements for aviators in key military positions should be considered. One way to do this would be to restrict these aviators to co-pilot only duties and waive their proficiency and flight requirements.

Aviation commanders, platoon leaders, and other key leaders have nearly the same flight proficiency requirements as other unit pilots. Aviation units are manned with the assumption that their commanding officers, executive officers, supply and maintenance officers, and other key support officers, will fly and meet the same general requirements as do other unit aviators.

To reduce environmental stress and improve aviation unit training, additional aviator tasks could be eliminated for key personnel. Restricting these aviators from operating as "pilot in command" might be necessary, but doing this might not reduce unit combat readiness or increase personnel requirements. These aviators would still be in charge of unit activities. Instead of meeting current standards, they would be required to fly with a fully qualified pilot. Then they could spend the bulk of their time performing leadership related tasks. Current requirements provide for a reduction in flying hours and flight task requirements for these key personnel.<sup>2</sup> But the provision may not provide sufficient relief.

Daily routines and responsibilities, both on and off the job, are the cause for the buildup of stress on an individual. The Army has a specific definition of stress: the bodily response to life events. Further, the Army classifies stress into two categories: environmental and self-imposed. Those stresses over which we have little control are called "environmental", and those over which we have more control are called "self-imposed" stresses.<sup>5</sup>

Any event, pleasant or unpleasant, that we are exposed to produces stress. Merely as a result of living, people are stressed, which results in wear and tear on the human mind and body. Some of the most common stressors from the Guard aviation environment are: emotional, such as worry about being able to meet requirements or procrastination in completing requirements; social interactions with other Guard members; noise from Army aircraft; change in the training requirements; and dissatisfaction with the ARNG.

Evaluations may also be a considerable source of stress for ARNG members. The National Guard is responsible for training to Active Army established requirements and is evaluated on performance by Active Army personnel. National Guard Aviation units are evaluated to determine their capabilities for carrying out their unit missions. Furthermore, a random sample of Guard aviators, both full-time and part-time, are evaluated on their individual flight and tactical aircraft employment capability in conjunction with unit training evaluations.

#### Full-time support

To make combat readiness achievable for reserve component aviation, each National Guard unit has limited full-time training and administrative

personnel. However, day-to-day aviation maintenance and individual aviator training is done through support supplied by Aviation Support Facilities (AASF).<sup>3</sup> Guard aviators meet their individual aviation training requirements through an AASF program of paid training periods exceeding those authorized for non-aviator Guard members.<sup>4</sup> The coordinated effort between supported units and the AASF enables ARNG training to meet Active Force standards. Tactical units plan training, and AASF provides the resources and personnel needed to conduct daily flight activities.

However, working relationships between the units and AASF are often not as effective as they should be. In accord with National Guard Regulations (NGR 95-2) ARNG units furnish their training schedules to AASF commanders. But because there is no chain of command relationship between the unit structure and the AASF, unit commanders do not always coordinate their activities with supporting facility personnel. Better coordination could result in a less stressful training environment, by providing more structured and organized training.

Active component personnel determine the Guards' ability to perform and are also available to help in training as requested. The requirement to meet the same training standards as their Active Army counterparts, even with Active Army assistance, probably accounts for a significant amount of stress to the ARNG aviator. The increased time needed for aviation training, plus the stressful nature of military flying, requires that the causes and effects of stress be considered when planning the training.

#### ARNG AIRCRAFT

Training to meet unrealistic requirements which are difficult and dangerous increases the stress of training. Many ARNG aviators are faced

with practicing current military tactics in obsolete aircraft that should not be deployed in combat. For example, about 392 of the Guard's 884 observation helicopters and many of the 370 attack helicopters are obsolete. Many attack helicopters are UH-1M "Gunships," which are Vietnam era aircraft unequipped to fill their assigned role of attacking Warsaw Pact tanks.<sup>9</sup> Flying old Guard aircraft assigned to unrealistic missions, Guard aviators may well question the reason for training to Active Army standards. When the mission clearly cannot be carried out with available aircraft, what is the purpose of training to fight as if the right aircraft will suddenly arrive the day the war starts? It may prove hard to build unit combat readiness and individual aviator morale when everyone knows that, because of obsolete aircraft, they cannot train as they would have to fight.

#### AVIATOR ATTITUDES

A 1985 aviator survey shows that Guard aviators have a favorable attitude toward the ARNG.<sup>6</sup> This same study indicates a possible future problem: It points out that Guard aviators believe there is a significant shortcoming in their ability to meet specific training requirements in the time available. Aviators were most concerned about tactical tasks, including night vision goggle flight. This shortcoming in available training time has been reduced since the study was done by adding more available paid training periods.<sup>7</sup> However, we do not currently know to what extent ARNG aviators can participate in newly available training periods. Also, we do not know if they consider part-time aviation duties to be overly stressful.

### Aviator attrition

Currently the ARNG has a low aviator attrition rate of around ten percent per year.<sup>8</sup> But about twenty-seven percent of all ARNG aviators are over 40 years old and have over 20 years of part-time military service.<sup>7</sup> If this group, which is eligible for a reserve retirement, should suddenly elect to leave, the Guard would be hard-pressed to replace them. This would be especially difficult during a period when the Guard's authorized aviator strength is increasing. Any more increases in training requirements on over-stressed part-time aviators could cause them to retire from the Guard.

Most aviators 38 years old or older are Vietnam veterans, combat-experienced aviators. For these people, training is simple because they are very experienced aviators; many are flying the same type aircraft as when they were in Vietnam. Within the next ten years, most of these aviators will retire from the Guard. They are currently being replaced by less experienced, younger pilots.<sup>8</sup> Also, the Guard is receiving limited quantities of new, more complex, fixed and rotary wing aircraft. For the Guard's program to produce combat-ready units, these new pilots must get the most out of every opportunity for training. Also, the Guard must retain these newly trained pilots in order to build a new pool of experienced pilots with hi-tech proficiencies.

### Aviator accessions

The average age and experience of the Guard aviation force is decreasing. The average age of ARNG aviators after the 3d quarter of fiscal year (FY) 1986 was 36 years, with 40% in the 34-39 age bracket. Since February 1981, the National Guard has mandated by regulation an age

limit of 27.5 years old for new flight school applicants, and the average age has declined over the last several years. Undergraduate Guard pilot training candidates (officer and warrant officer candidates) to Active Army flight school currently exceeds 260 per year. Over time, this rate should take care of growth requirements, as long as low attrition rates continue.<sup>9</sup>

Aviators also come to the Guard from the Active Army, other services, the Army Reserve, and the Civilian Acquired Skills (CAS) program. The CAS program sends highly trained civilian aviators with prior military service, but no prior military aviation service, to an Active Army short (12 week) rotary wing flight course. All other reserve component aviators must be graduates of an active military flight training course for the type aircraft they will fly--fixed or rotary wing. Providing a quality low stress training environment will likely assure an adequate supply of ARNG aviators.

#### ADJUSTING TO CHANGE

Like other institutions, the ARNG is facing a rapidly increasing rate of change in several important areas. Changes by their nature foster stressful working environments. Guard aviation structure is beginning to conform with the Army of Excellence (AoE) force structure between now and 1991. Management of this change presents a significant challenge to Guard leaders and individual unit members alike. Especially significant is the fact that the Guard is continuing to train established units and simultaneously fielding new units. In July 1986, there were 172 units in ARNG aviation. By 1991, there will be five groups, eleven brigades, and forty-eight battalions -- a total of 283 units.<sup>10</sup>

Reorganized aviation brings promotion opportunities and the possibility of receiving new aircraft. These are exciting possibilities. Yet change of this magnitude is likely to be stressful under the best of circumstances. Guard aviation reorganization will allow for better management of aviation activities and more functional unit structures.

The support structure is designed to solve most potential Guard aviation program problems. So program success may just be a matter of Army leaders recognizing other potential problems and taking adequate corrective actions to assure success. We need further research on the perceptions of Guard aviators about the Guard environment. Nonetheless, acting positively on currently known information might greatly improve the Guard Aviation program.

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6. Ibid., pp. O-47.
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## CHAPTER IV

### DEALING WITH STRESS

Dealing with stress is a critical aspect of ARNG aviation program effectiveness. Relating what is currently known about stress to the situation faced by the ARNG aviator is essential to this effort. The purpose of this chapter is review some of what is known about stress and relate it to the ARNG aviation program.

Army publications advocate coping strategies that start with attempts to help pilots handle stress in appropriate ways. First, they suggest that people who effectively cope with stress are physically fit, get plenty of rest, and maintain a balanced diet. In addition, they recommend that the Army aviator stay away from alcohol and drugs. Exercise is excellent, but be careful, they caution, of competitive sports. This is because if you are the competitive, aggressive type, sports can significantly increase your level of stress. Exercise involving jogging, cycling, or swimming at least three or four times a week is recommended. Exercise helps a person get into better shape, thus to be better able to resist stress. Next, they recommend learning to manage time, so that rushing to meet deadlines and appointments becomes unnecessary. Also, they suggest that a realistic, positive self-image is helpful. Finally, the Army's stress plan advises seeking professional help from a flight surgeon, counselor, or chaplain if you cannot solve your own problems.<sup>1</sup>

Army coping strategies are appropriate for the ARNG, so the full-time Guard leadership should make a significant effort to communicate them to the part-time aviator. Information about the necessity for a balanced diet and limiting alcohol consumption, for example, is likely to be a last priority training item. Stress education promulgated through rules--like the number of hours prior to flying that alcohol can be consumed and the use of illegal drugs--will likely be understood by all ARNG aviators. But even though the rules are understood, the health advantages to the individual may not be understood. The aviator will observe rules, but he may not take their rationale to heart. Rules may govern specific behavior, but they may not alter lifestyle.

Exercise in the ARNG is currently authorized (required in many units) during all paid training periods. In addition, the Guard requires that all soldiers under 40 years old complete and pass the same physical fitness test as Active Component members. ARNG soldiers over 40 are being screened by medical people for clearance to be tested. Aviators are somewhat easier to screen than the rest of the Guard population because of the nature of the annual flight physical. Still not all Guard aviators over forty complete the same physical readiness test as Active Component aviators.

The problem in designing regulations for the control of stress, in an effort to minimize fatigue, is one of imperfect knowledge with regard to cause and effect relationships. In the aftermath of the Vietnam War, Army leadership became increasingly concerned with aviation safety and improving the public image of the Army. The Army decided to provide

stress control education based on early aviation studies. These studies showed that fatigue was an important problem in helicopter operations.

Apart from the effects that fatigue has on efficiency, it was also found to be an important contributory factor in helicopter accidents, both in peacetime operations and in the combat environment. These early studies indicated that many of the major causes of fatigue resulted from inadequate training on the part of those responsible for the well-being of pilots. The conclusion was that training in the causes and effects of fatigue would, of itself, lead to changes of organization and procedures which would minimize fatigue.<sup>2</sup>

The problem with concluding that education would solve the dilemma of fatigued pilots was that Army helicopter pilots were controlled by the ground commander and worked under the same conditions as the ground soldier. Army aviation critics believe that ground commander's do not understand the significance of aviator fatigue. It is argued in one interesting study, Helicopter Aircrew Fatigue by the Aerospace medical panel of AGARD-AR-69, that because of the increasing complexity and expense of the aircraft used, the aviator should be considered as more of an integral part of the man-machine complex.<sup>3</sup> Fatigue was thus more critical for his job than for the ground soldier's job. Therefore, the study suggested aviators be managed and supported more like the pilots of the Air Force and Navy. Some ARNG ground commanders, who see themselves losing control of "their" aviation, oppose these ideas.

Actually it is not a question of who controls the aviator. Rather it is a matter of assuring that whoever is in control is educated about the effects of stress and fatigue. The Advisory Group for Aerospace Research

and Development (AGARD) study (Helicopter Aircrew Fatigue) convincingly describes the results of not properly managing aviators. The AGARD study highlights understanding as critical to the performance of aviation in combat, where fatigued aviators will not likely succeed. In the peacetime training environment, commanders must understand and take preventative action regarding stress and fatigue to minimize accidents and increase combat proficiency.<sup>4</sup> Not control, but awareness on the part of those who are in charge is necessary to maintain a combat-ready, accident-free aviation force.

### **STRESS/FATIGUE/ACCIDENTS**

The Army continued to debate the role of Army Aviation until 1982, when it formed the Aviation Branch. Army Aviation had finally become an equal member of the Army "combat arms team." During this time period, because of increasing numbers of aircraft accidents and continued uncertainty about how to define and evaluate stress and the resulting fatigue, a "risk-prudent", as opposed to "risk-tolerant", approach was adopted to ensure that Army pilots were able to safely accomplish their duties. The risk-prudent approach recognized that zero-risk is unachievable. Yet this approach requires that regulations and procedures be implemented even though their basis is not firmly established. A risk-tolerant policy would have required proof of the necessity for regulations and procedures prior to their adoption.

The Army has assumed that there is a direct cause and effect relationship between stress and fatigue and that certain measures can be used to minimize the consequences of each. For the most part, stress and fatigue control is said to be an individual responsibility. But to assure

pilots are aware, stress policy is regulated and supported by the command structure of the Total Army. The Total Army has implemented a risk-prudent course of action, considered most likely to further the organization's goal of safe, successful mission accomplishment. The effect, of course, of this risk-prudent approach cannot be determined. But the outcome of a risk-tolerant approach, which would demand little in terms of regulation, certainly would increase accidents and reduce efficiency.

The Army stress and fatigue policy is supported by education programs and regulations in an attempt to ensure that individuals and commanders pay attention to the assumed problem. The Army program to promote individual responsibility includes education concerning stress and fatigue, life style, physical fitness, diet, and weight control. It requires physical examinations, physical fitness training and testing, mandatory weight standards and, for Army Aviators, suggested "crew rest" standards.<sup>5</sup>

Because of individual differences, only the individual is fully able to control his own stress and resulting fatigue.<sup>6</sup> To ensure that individual pilots are aware of this, the Army has designed regulations detailing individual responsibilities. Consequently, each pilot should learn to recognize the effects of the stresses created by the demanding tasks of the aviation environment on his ability to perform effectively and safely.

The Guard also educates in an effort to increase awareness of the dangers of stress and fatigue. The Guard sends commanders and aviation safety personnel to various Active Army and Guard conducted schools on accident prevention and stress education. Education of the Guard

leadership is helpful and necessary. However, because of the part-time status of most Guard members, it is difficult for all commanders and safety people to complete the required training.

### RESTRICTIONS AND PROCEDURES

In addition to the "crew rest" standards mentioned above, the Active Army and the ARNG have introduced a number of additional rules designed to minimize aviation accidents.<sup>7</sup> Some, but not all, of these regulations are based on stress considerations. For example, there are rules concerning the number of hours required between drinking alcohol and flying; likewise, regulations specify rest time required between physical training activities and flying.<sup>8</sup> Many rules, however, are brought about by accident investigations that point out individual pilot judgment errors. Through such rules the Army hopes to prevent similar accidents. An example of a judgment error would be a pilot who flies low to the ground without previous knowledge of hazardous obstacles and subsequently flies into power lines. Through regulation of altitude, the ARNG seeks to avoid this type of "poor judgment" accident. In cases where rules are violated, pilots can be held accountable.

Rules not mandated by the Active Army but considered necessary to ARNG Aviation activities are written into National Guard regulations, ie. 500 foot rule. A number of years ago the Guard had some serious accidents as a result of aviators flying low in areas where they had no knowledge about hazards to flight. As a result, the National Guard Bureau published a regulation that requires that no flights be made below 500 feet above ground level, unless conducted in an approved area and briefed as such a

mission. The intent of this and other similar rules is to reduce accidents. The effort has had limited success.

The problem with rules is that when you have too many of them, some will surely be ignored. No one can say which rules are ignored in the Guard aviation program unless accidents result from their violation. Yet some rules that require aviators to take unnecessary actions, such as maintaining instrument proficiency when their assigned aircraft are not capable of performing the mission, may be ignored until just prior to annual evaluation. This type of situation causes the part-time aviator to concentrate on stressful required tasks, possibly at the expense of combat readiness.

#### PREVENTION EDUCATION

A rational approach to Army Aviation safety policy requires a clear definition of what accident rate is acceptable. In reviewing Army aircraft accident statistics, one soon discovers that there are no new causal factors for accidents. In fact, the same old combinations of cause factors are repeated, causing new and more costly aircraft accidents. As a result of the same factors being repeated and causing additional aircraft accidents, Army aviation leaders are under a great deal of pressure to keep accident cause awareness high. Accidents are considered unacceptable. Destruction of equipment, injured or killed personnel, and the resulting failure to accomplish the military mission tarnish the image of a "professional Army", waste valuable resources, and destroy morale.<sup>8</sup>

As well using up tax dollars, soldiers' health and lives, accidents can be "tough" on the careers of aviation personnel. Of course, no accident is acceptable. Therefore, the Army has dictated that the accident rate will



be zero. If an Army aviator, Army aviation unit commander, or section leader wants unfavorable attention, all he needs is some involvement in an aircraft accident. This "pressure from the top" can, in fact, result in a great deal of stress for the individual members of the Army aviation community. Careers can be made or lost depending on the accident record of the individual aviator or aviation leader.

### Stress management

In gathering the information to write this paper, I discovered two important facts relevant to the Army approach to stress management. First, the Army has done very little research of its own on stress. Rather, it has accepted as militarily relevant the research and conclusions arrived at by civilian and other military service sources. Secondly, military programs are directly charged with identifying and removing from the service pilots with chronic stress or other chronic performance impairments. The Army is interested in pilots being able to cope, and help is available for the person who cannot. However, the pilot who recognizes he or she has a problem should understand that seeking help can result in removal from the aviation environment and perhaps from the military. As a result few aviators will admit to having a problem in coping with stress. The bottom line for both the Active Army and the ARNG is the elimination of accidents: Accident prevention takes precedence over the interests of individual Army aviators.

The Army wants to avoid the loss of equipment and injuries or death of personnel resulting from accidents. This is why the program they have chosen is really not a "coping approach," but rather an "awareness of stress" educational program, designed to identify and eliminate accident

cause factors. The Army has coupled prevention education (stress management, exercise, weight control, anti-smoking, balanced diet, etc.) with mandatory programs (physical fitness, maximum and minimum weight limits, etc.) that are geared to helping the Army pilot avoid, rather than correct problems. If problems with which the pilot cannot cope present themselves, military medical, legal, spiritual, and other types of aid are available. But avoidance of problems is the primary Army approach, and so a number of techniques for prevention are offered in the hope that the military pilot will have a healthy, productive, accident-free flying career.

#### Role of the Flight Surgeon

Army pilots are a pampered group in comparison with personnel in different duty assignments. As members of an elite group, aviators even have their own specialist doctor: the military flight surgeon. The pilot who feels ill is directed to discuss his problem with the flight surgeon, who is specially trained to deal with the aviators' problems. The drawback here for the Army pilot is that the flight surgeon has the power to stop him from flying and even to initiate actions that can eventually result in termination of his aviation service. In addition, supervisors know when pilots are "grounded". So if aviators are unable to fly, these supervisors may question the value of the affected aviator to the service. This system tends to discourage pilots from seeking medical assistance, except in the most serious of situations or for minor medical problems. On the other hand, it does promote wellness among aviators because the Active Army flight surgeon is actively involved in unit activities and he knows his patients.

The ARNG has authorized flight surgeons, but unlike the Active Army it has no organized aviation medical program. Flight surgeons are supposed to be active participants in the aviation program. Yet in the National Guard they may conduct flight physicals, but few are involved in providing clinical care, serving as consultants to aviation commanders, and other tasks outlined in Army publications. Flight surgeons are authorized the same paid periods as aviators and could be available to the ARNG aviator on a regular basis. But, The National Guard Bureau does not provide the guidelines for the ARNG aviation flight surgeon program. Lacking guidance, ARNG flight surgeons do not play a substantial role in the long-term success of Guard aviation.

#### Crew rest

A strict application to the Guard of Active Army recommended crew rest standards is impossible in the Guard aviation environment. During AFTP flight training, it must be left up to the individual aviator to determine fitness to fly. These people come from a variety of full-time work situations, often flying at night after working all day or on a weekend after completing a full work week. During Annual Training, the Guard aviation commander can implement strict crew rest standards. On weekends he should implement modified standards by limiting the drill aviation duty time. The key to crew rest for the Guard aviator may be self-awareness, regulation, and flight surgeon involvement, coupled with command awareness and discipline.

#### Health practices

For the Guard to maintain a long-term effective aviation program, it must maintain a force of trained aviators. For this to be accomplished,

long term retention must be maximized. One thing that will help assure that an aviator can be retained is helping the aviator to maintain good health. Aviators who must maintain higher levels of physical health than other military members can be greatly assisted in this task by active military leadership. Better aviator health practices could result in a much healthier ARNG aviator population, one that can be retained. Healthier ARNG aviators will be able to handle the stress associated with flying operations, thereby improving the probability that the Guard will meet its war time requirements.

#### **STRESS PROGRAM OBJECTIVES**

Army literature indicates that stress and fatigue cannot be measured because no two individuals are alike. They vary in eating and sleeping habits, emotional makeup, etc. Consequently, Army stress and fatigue programs encourage pilots to recognize the stresses impacting on individual performance. They further encourage individuals to develop coping behaviors. The program finally sets forth regulations which deal with individuals who will not or cannot develop the required skills.

In evaluating the Army solution to stress coping, we must consider the mission of the military and the fact that not all people are cut out for a career as a military aviator. Military aviators as a group are supposed to be high stress "copers". If this were not so, they probably would have found less stressful occupations. In order to be a successful combat or peacetime pilot, a military pilot must accept a certain amount of calculated risk. The military pilots may not only be high stress copers, but also high stress seekers. But even among aviators there are likely individual

differences in stress-coping ability which require the Army to adopt a risk-prudent approach to stress management.

The military needs to recruit and develop a youthful, vigorous fighting force. It is not really in the business of providing a healthy, life-long program for individual soldiers. What the Army advocates in their approach to stress management reflects the "lean, mean, fighting machine" philosophy of today's Army. In addition to the obvious short-term advantages of the Army physical fitness program, such as the ability of the physically fit to go on a long hike, the Army is also concerned about its image in the civilian community. This is the reason for such slogans as "Think, Look, And Act Like A Soldier." Nevertheless the ARNG must be concerned about the long-term health of its aviators in order to maintain combat ready aviation units.

There are clear indications that controls under conditions of uncertainty are necessary in preventing accidents. A risk-tolerant approach to management in Army aviation is unacceptable. Such a policy would likely result in the opposite of the desired result of a professional Army. However, we cannot establish a clear cause and effect relationship between the Army policy with regard to stress and the status of the aviation program. Regardless of other considerations, stress education, required physical fitness, and mandatory weight control are important aspects in the lives of pilots in today's Total Force Army.

#### ENDNOTES

1. Headquarters D.A., Field Manual (FM) 1-301, Aeromedical Training For Flight Personnel, Fort Rucker, Alabama: U.S. Army Aviation Center, May 1987, pp. 2-1 -- pp. 2-14.

2. Advisory Group For Aerospace Research and Development, Helicopter Aircrew Fatigue, Paris France, May 1974, pp. 9.

3. Ibid., pp. 9.

4. Ibid., pp. 9.

5. Headquarters D.A., Army Regulation (AR) 95-1, Aviation Flight Rules, Washington, D.C., December 1986, pp. 16.

6. Headquarters D.A., Field Manual (FM) 1-301, Aeromedical Training For Flight Personnel, Fort Rucker, Alabama: U.S. Army Aviation Center, May 1987, pp. 2-9.

7. Headquarters D.A., National Guard Regulation (NGR) 95-1, Aviation Flight Rules, Washington, D.C., July 1986, pp. 2-2.

8. Headquarters D.A., Army Regulation (AR) 40-5, Preventive Medicine, Washington, D.C., September 1974, Section 3.

## CHAPTER IV

### CONCLUSION

Department of Defense Total Force policy makes ARNG aviation force structure critical to achieving the national security objectives of the United States. Reduction of stress and fatigue may be the key to increased aviator retention, job performance, mission readiness, and--most important--accident prevention. As Guard aviation training requirements increase, as Vietnam era aviators retire, and as the Guard continues to depend on volunteers, a healthy, low-stress environment for ARNG pilots will be increasingly important. The long term success of ARNG aviation may depend on how well military leaders can minimize potential stress and fatigue problems.

The increased dependence of the Active Army on the Guard assures the Guard will be activated at the outbreak of a war. Understanding that the Guard may be used to fight, combat ready or not, is important. The success of the Total Force aviation program depends on committed combat ready ARNG aviators. So every effort should be taken to guarantee that ARNG aviators are physically and mentally prepared for combat.

Stress from the ARNG aviation environment may be a significant deterrent to Total Force aviation readiness. The part-time all-volunteer Guard aviation force must be able to participate in well-planned, well-led training programs. Full-time Guard personnel must support the full-time support needs of the part-time aviators. This can be accomplished by good planning and effective Active Army participation in the ARNG program.

National Guard aviation has the potential to be a combat ready cost effective military force. Decreasing training requirements, updating or

replacing obsolete aircraft coupled with professional well-planned training will likely result in a successful ARNG. Stress reduction and wellness training coupled with effective use of the flight surgeon will assist the training effort. The risk-prudent approach to stress is correct for both the Active-Army and the ARNG. However, for the ARNG to maintain its aviator strength and its aviation unit combat readiness, long-term retention of aviators is critical. Professional management and support of the part-time aviator is essential to this task.

### RECOMMENDATIONS

1. Restrict key personnel enrolled in military education programs to co-pilot duties and waive their flight training requirements.
2. Reduce the flight requirements of all aviators in key unit positions.
3. Establish a command relationship between the AASF and the supported tactical aviation units.
4. Issue newer aircraft or update non-mission capable aircraft or change the mission of units with obsolete aircraft.
5. Educate Guard aviators on such things as the value of a positive self-image and proper management of time.
6. Implement the Physical readiness test for all members of Guard aviation units--speed up screening of aviators over forty years old.
7. Train aviators and commanders on the causes and effects of fatigue.
8. Publish a National Guard regulation that outlines the basis for an effective ARNG flight surgeon program.



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